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ARBORETUM BULLETIN

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Concerning This Issue...

As this issue of the *Bulletin* proves — winter does not have to be drab and dreary, particularly in the Arboretum. There are many winter birds to be seen with the plants that come to life when all else is asleep (page 8). The hellebores are blooming and on page 22 we have reprinted a 1944 article about which ones are best, how to grow them, and their uses as cut flowers for arrangements and corsages. Now when was the last time you wore a corsage? Brian Mulligan keeps us taxonomically up to date on that fragrant winter-blooming genus, *Sarcococca*. Cass Turnbull, the PlantAmnesty activist, browbeats us on how *not* to prune our birches and vine maples so that we may look at beautiful branching patterns in the winter instead of dead wood.

For those gardeners who are looking ahead toward spring, Jan Pirzio-Biroli has written an article on Leguminous trees in the Arboretum. If you are considering planting one of these lovely trees in your yard now is a good time to go to the Arboretum and see what they look like in winter. It is so important to consider every season when choosing a plant and its location. Van Bobbit, in his article "Plants of the Winter-Rain Regions: California," describes many California natives that may thrive in suitable locations in the Northwest. He has chosen the pick of the litter and offers suggestions on how they might be used. Tamara Buchanan and Doug Benoliel, in Part II of their article on Nepal, also discuss possible landscape uses of the Nepali plants they collected and/or saw on their trek. We are very lucky to live in a climate in which we can grow so many things from all over the world. And we are particularly fortunate to have an Arboretum where we can go to view many of these plants!

Nancy Pascoe
Editor

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The Washington Park

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COVER

Helleborus lividus, livid hellebore.
From the book, *Hardy and Half-Hardy Plants,Vol.2*,
by A.W. Darnell, 1930. Courtesy of the
Elisabeth C. Miller Rare Book Collection.

The Leguminous Trees of the Arboretum

JAN PIRZIO-BIROLI

The Leguminosae[1] (or pea family) have a worldwide distribution from the tropics to boreal latitudes (north and south), although their heaviest concentration is in tropical and warm-temperate areas of the Northern Hemisphere. Most members of the family are trees and shrubs, but such herbaceous genera as *Astragalus* and *Lathyrus* spread as far north as Alaska. Clover (*Trifolium*), alfalfa (*Medicago sativa*), and peas themselves (*Pisum sativum*) are all members of this diverse plant family, which is united by a single fruiting character: the production of *legumes* (pods), opening on two sutures to release seeds which are enclosed in a single *locule* (cavity). Other characteristics frequently associated with the family are: 1) alternate, pinnately compound leaves and 2) stipules which may take the form of tendrils (as in sweet peas) or thorns such as one finds on black locust trees (*Robinia pseudoacacia*). The flowers, which fall into three categories, serve as the basis for dividing the family into subfamilies. Two of these flower forms are mainly associated with tropical genera and will be described in connection with their few representatives in the Arboretum's collections. Those species hardy enough to survive in our temperate climate fall mainly into the subfamily Faboideae (formerly Papilionoideae), the latter name derives from the Latin *papilio* (=butterfly). *Papilionaceous* flowers, also known as pea flowers, typically have five petals which are arranged in the following manner: one wide petal, the *banner* (or standard) at the top of the flower; a pair of wings; and a pair of petals which join together below the wings to form the *keel*. The keel encloses the ovary and usually ten stamens, which characteristically are united in one way or another. Thus we have a butterfly, albeit a rather fanciful one.

The Arboretum's collection of Leguminosae is concentrated on the east side of Arboretum Drive, north from the head of Rhododendron Glen to the Mediterranean (Rock Rose) section, with a few species planted in that section, and even as far north as the *Sorbus* collection. However, specimens of such genera as *Wisteria*, *Cytisus*, and *Genista* may be found in many parts of the Arboretum and certain tender species are planted in more protected locations.

The collections contain over 25 genera representing approximately 100 species and cultivars. Obviously a single article or series of articles would make very dull reading if every taxon were described. I propose to concentrate upon the more important and/or interesting trees in the collection.

The line drawings in this article are from the book, An Illustrated Flora of the Northern United States, Canada and the British Possessions *by Nathaniel Lord Britton, published by Charles Scribner's Sons, 1913. Courtesy of the Elisabeth C. Miller Library Rare Book Collection.*

Albizia julibrissin

The silk tree is fondly known as the mimosa in the southern United States. It is a widespreading, flat-topped tree reminiscent of those in a tropical savannah; and rightly it should be, for this is the main representative in the Arboretum of the Mimosoideae, the subfamily of *Acacia*-like plants mainly native to the tropics. *Albizia* itself is an enormous tropical genus of which only this species is truly hardy in temperate climates.

The inflorescences of the Mimosoideae are clustered in pompons of minute flowers whose calyx and petals are so inconspicuous that only the stamens (united at the base and usually10 to a flower) are noticeable even at close range. These inflorescences spread in foamy masses over the branches. They range from cream through pink to bright rose (in the variety *rosea*). The Arboretum's several specimens have a distinctive color range, although most of them came from a single source, illustrating the advisability of acquiring young plants in bloom.

The leaflets are bipinnately compound (i.e., leaflets composed of leaflets). These numerous small structures exhibit the tendency of their subfamily to fold up on each other if disturbed (cf. the "sensitive plant" of greenhouses). Actually during summer they do close each evening as darkness descends.

Albizias are most effective when they are positioned to be seen from the south. Not only do they achieve maximum bloom with this orientation but also they have a strong tendency to face toward the light. The Arboretum's specimens grow at the north end of the Mediterranean section facing south with a grove of western red cedars as a background. Their widespreading branches give a tiered effect, tending to droop under the weight of their leaves and flowers.

This species is among the last to leaf out in the spring and one of the few trees that bloom for a long time in late summer. During that period, and into fall, it rivals our famous (or infamous) madrona for the quantity of shedding vegetable matter, i.e., spent flowers, falling leaves and eventually the slender pods. Best to plant a silk tree where a little litter is not a problem.

Albizia julibrissin is a fast growing tree

Cladrastis lutea, the yellow-wood tree.

useful for "instant landscaping." Probably, for this reason it tends to be short-lived. The branches are somewhat brittle and since they may hold their leaves well into autumn, they are vulnerable to breakage during an early wet snow.

Cladrastis species

A small genus of deciduous trees, little known in the Pacific Northwest, is *Cladrastis* whose name is derived from the Greek and refers to the brittleness of its branches (although thus far this has not been a problem in the Arboretum). The entire genus is distinguished from similar legumes by having a leaf stalk whose swollen base surrounds the axillary bud. The papilionaceous flowers are borne in panicles. Two species in the Arboretum are of particular interest.

Cladrastis lutea, the yellow-wood of southeastern United States, eventually becomes a medium-sized tree with a rounded head. Two specimens in the Arboretum's collection are typically branched near the base and are approximately 40 feet tall and rather slow-growing when one considers that they were planted in 1950.[2] Even though they are somewhat shaded, facing northwest toward the giant sequoias that divide the Leguminosae and the Mediterranean sections, their leaves turn a

Nitrogen Fixing

An interesting and useful characteristic of some members of the Leguminosae is their ability to extract nitrogen from the air, "fixing" it in the soil and thus — in a sense — fertilizing it, since nitrogen is a major component of most commercial and organic fertilizers. This feat is accomplished through the invasion of the root hairs by a bacterium, a species of the genus *Rhizobium*. Thus a symbiotic relationship is established between plant and bacteria, forming nodules on the roots which are visible to the naked eye when roots are exposed. The species of *Rhizobium* are specific to host legume species; more than 3000 strains of rhizobia have thus far been recognized.

It should be noted at this point that there are other non-leguminous plants also capable of nitrogen fixation such as *Alnus rubra* and *Dryas octopetala*. Both of these are pioneer species whose ability to invade stripped soils may be due to bacterial nodulation.

The following table details the nitrogen fixing capabilities of the species described in this article. All information concerning legume nodulation is drawn from the study cited below.

Albizia	*A. julibrissin* and many other species of this genus are abundantly nodulated and considered to be good soil-improvement plants.
Cladrastis	One of the few papilionaceous genera in which no nodulation has been observed.
Gleditsia	Non-nodulated, possibly due to the stiff root hair walls which prevent invasion by the rhizobia.
Gymnocladus	Found lacking in all studies of *G. dioica*.
Laburnum	Nodulation reported on both species.
Maackia	One report of nodulation in *M. amurensis* var. *buergeri*, but found lacking in the variety *M. amurensis* and in *M. chinensis*.
Robinia	Nodulation widely reported in *R. pseudoacacia* and *R. viscosa* (the parents of *R.* 'Idaho').

The Leguminosae, A Source Book of Characteristics, Uses and Nodulation, by O.N. Allen and Ethel K. Allen. University of Wisconsin Press, Madison, WI, 1981.

rich golden yellow in autumn. They are distinctive in that the terminal leaflet, of the seven to nine leaflets, is obviously the largest. The flowers, which occur in mid-June, are white and fragrant, loosely borne in 8- to 14-inch pendent inflorescences.

Cladrastis sinensis, from China, is a smaller, finer-textured tree with up to 17 leaflets. Like the silk tree (*Albizia julibrissin),* it is one of the latest species to leaf out in spring, occasionally causing alarm to those who are unfamiliar with this habit. The large, erect inflorescences of blush white gloriously cover this small tree in July when it blooms, which is infrequently[3] . The Arboretum has a graceful specimen that grows northeast of its American relatives, near the giant sequoias.

Maackia species

This small genus of Asiatic trees is considered to be a distant relative of the foregoing *Cladrastis*. The relationship is based upon the fact that it too has swollen leaf bases, but in this case the stalks do not enclose the bud. The inflorescences of numerous, small off-white flowers occur in terminal, densely packed, upright racemes, often joined to form a panicle. The flowers are valuable in that they occur in mid-summer when little else blooms in the Arboretum.

Two species and a variety are represented in the Arboretum's six specimens. They are *Maackia amurensis*, its variety *buergeri*, and *M. chinensis*. The latter is the most attractive of the three taxa, with beautiful leaves containing

nine to thirteen leaflets that are covered with a silvery down when they first appear in spring and retain some pubescence throughout summer.

The maackias have an architectural quality with large, rounded heads; they form a distinctive planting near Arboretum Drive midway in the Leguminosae section. Such a plant would be useful for landscaping in an open situation.

Robinia species

The genus *Robinia* is characterized by large, pendent racemes of showy pea flowers, reminiscent of the inflorescences of *Wisteria*. Its species are all native of North America, especially of the eastern United States.

Robinia pseudoacacia, the black locust, is perhaps best known and most widely planted, having become naturalized in many parts of this country and in Europe. The tendency to spread by seed and suckers has contributed to its wide distribution, a habit which may be a problem in some locations while serving to stabilize the soil in others.

Dense, seven-inch racemes of white flowers are produced in late spring and early summer. They are deliciously fragrant, particularly in early evening. The six- to twelve-inch leaves have five to eleven pairs of leaflets, with stipules often remaining on the branches to become one-inch thorns. The common name derives from the dark, deeply furrowed bark of mature trees, whose gaunt habit may be avoided by judicious pruning in youth to maintain a strong central leader. Although the branches are known to be brittle, the wood of mature trees is close-grained and able to resist rot at ground level; it has been used for everything from shipbuilding to fence posts.

Among the specimens in the Arboretum are three large trees at the southwest end of the Leguminosae, each of which has come into the collections as a different cultivar. East of them, *Robinia pseudoacacia* 'Tortuosa' is a small, delicate tree with twisted branches, that has the potential to become much larger as it matures. 'Pyramidalis' is a fastigiate form growing in a bed of hybrid brooms (*Cytisus*) near the road.

Robinia pseudoacacia has formed a number of hybrids with the pink-flowered *R. viscosa,* as a group they are named *R.* x *ambigua*. Among these is the attractive *R.* 'Idaho' (or 'Idahoensis'), which is known for its durability in stressful sites and is widely distributed in the nursery trade. The Arboretum's specimen was broken off at four feet by the Columbus Day storm in 1962 but has since become a spreading tree about 25 feet tall. It blooms in mid-June with dense racemes of large, pale pink flowers. A seedling from it growing nearby is a tall, slender tree with deeper rose-colored flowers than 'Idaho' itself.

Inflorescences and foliage of Maackia chinensis.
photo: Brian O. Mulligan

Gleditsia triacanthos forma **inermis** (thornless honey locust)

This native of the central United States is not to be confused with the genus *Robinia*, which also has the common name "locust". Its leaflets are smaller and more numerous: 10 to 15 pairs on a four to eight-inch leaf, which occasionally may be bipinnately compound (as in *Albizia*). In addition, its inconspicuous inflorescences (compared to those of *Robinia*) are interesting only because they have nearly equal petals, thus making *Gleditsia* one of the few genera of the subfamily Caesalpinioideae that are hardy in temperate climates.

The species has been the subject of considerable selection during the last 40 years to eradicate the large, somewhat messy looking legumes and the horrendous, branched thorns which occur on the trunk and branches (thus *inermis* = unarmed). The Seattle street tree

Robinia pseudoacacia, *the black locust.*

program has planted 'Shademaster' in the Ballard area. In the Arboretum, one of the most noticeable cultivars is 'Sunburst' growing at the north end of a small bed in the southeast corner of the Leguminosae section. In late May and early June the new yellow leaves are splendidly complemented by the flowers of *Genista tenera* and *G. cinerea* nearby. Later in the season all but the newest leaves are green until autumn when there is a second golden display. Nearby, the Arboretum grows the cultivar 'Elegantissima', a small, somewhat shrubby plant with lovely foliage. 'Imperial' at the north end of the Leguminosae facing the rock roses has become a larger, more imposing specimen.

The cultivars of honey locust have been widely publicized as ideal street trees or lawn plantings, a recommendation based upon the lacy foliage which casts only light shade and upon the graceful, often widespreading habit. Unfortunately they have been greatly overused and more recently have become liable to several diseases and insect pests, rendering them less desirable than originally had been thought.

Gymnocladus dioica

The Kentucky coffee-tree is so called because its seeds were used by early settlers in the eastern United States as a substitute for coffee. The species is notable in the Arboretum for its enormous bipinnately compound leaves, which are up to three feet long and two feet wide. The lowest pair of pinnae are simple, while those above bear four to seven pairs of stalked leaflets. These turn a beautiful bright yellow in autumn before falling from the leaf rachis, which may remain on the tree for several days, giving an odd effect of wispy golden twigs.

Three of our trees grow in the north end of the Leguminosae east of the Mediterranean section. Because of their few stout branches they have the appearance of being quite young although they range in height from 20 to 30 feet. The oldest was planted in 1949 and the others in 1954 and 1968. Since they are potentially 100-foot trees where they grow natively from Nebraska and Oklahoma east to New York, they obviously have been very slow-growing in our climate.

Gymnocladus dioica is unusual not only because of the size of its distinctive leaves but because it is dioecious — a rare occurrence in the Leguminosae. In addition, the flowers of blooming specimens are completely regular, making them another member, besides *Gleditsia*, of the Caesalpinioideae. They are borne in upright panicles, the staminate inflorescences being considerably smaller than the 12-inch pistillate ones. Arboretum records do not show that our trees have bloomed. However, the oldest and largest of them had three legumes remaining on its bare branches in winter of 1986 and staminate flowers were observed on one of the younger trees the following spring. Mature trees have an irregular branching pattern. The bark is roughly checkered in gray patches tinged with red, especially in winter. Our specimens already are beginning to exhibit these features, which give them a picturesque winter habit making them easily distinguished from afar.

Laburnum (golden chain tree) and an intergeneric hybrid

Laburnum is a small genus of European

natives whose pendent racemes of large, papilionaceous flowers are a bright yellow as if they were a golden-flowered *Wisteria* or *Robinia* . The leaves are trifoliate (i.e. having three leaflets) and this character, combined with the flower color, gives botanists reason to believe that laburnums are closely related to the genus *Cytisus* which usually also has yellow flowers.

Laburnum anagyroides is widely naturalized in the Seattle area and, indeed, in the Arboretum. It is the least attractive of the species we grow, often having numerous awkward suckers and bearing cylindrical, few-flowered racemes ten inches long or shorter. In contrast, the much rarer *Laburnum alpinum* has graceful, narrowly tapered, many-flowered inflorescences up to 15 inches long and a similarly graceful branching habit, making a vase-shaped, single-trunked shrub or small tree; ours are branched at the base. The hybrid between the two species is collectively called *L.* x *watereri* of which the cultivar 'Vossii' is readily available in the nursery trade, as it deserves to be. It is a slender, single-trunked tree with tapered inflorescences described as being up to two feet long.

The legumes of the genus have seeds which are extremely poisonous, especially if eaten when they are green, the time when they are most likely to be attractive to children. Fortunately, *Laburnum* 'Vossii' growing as it does in tree form, bears its pods high in the branches, less available for plucking.

Laburnum anagyroides is often used as an understock for related species and genera. A graft hybrid, known also as a chimaera, is *Laburnocytisus + adamii* which arose in a French nursery near Paris in 1825. This unusual, always accidental, phenomenon occurs from the indiscriminate mixing of cells between scion and understock. In this case, *Cytisus purpureus*, a twiggy, slenderly branched small shrub, was grafted on *Laburnum* rootstock, giving rise to a small tree with a mixture of flowering and vegetative characters. The hybrid is represented by flowers of a purplish yellow, while some branches bear golden racemes instead, a reversion to *Laburnum*. *Cytisus purpureus* is represented by apparent witches' brooms which have pinkish purple

Gymnocladus dioica, *Kentucky coffee-tree.*

flowers like the scion. *Laburnocytisus* is an oddity rather than a plant of great horticultural merit. One wonders what led the nurseryman, Jean Louis Adam, to make the graft in the first place. However, it offers some confirmation to the theory that the two genera are closely related.

Laburnum anagyroides grows in several parts of the Arboretum, including the bed on the west side of Azalea Way just north of the path to the Lynn Street footbridge. Two large plants of *L. alpinum*, are at the south corner of the parking lot between the Leguminosae and the Mediterranean sections. Nearby are specimens of *Laburnocytisus*, which is also growing near Arboretum Drive south of the group of giant sequoias. Our single specimen of *Laburnum* 'Vossii' is in this general location just north of the maackias.

In the next issue of the Arboretum Bulletin *Jan Pirzio-Biroli will discuss Leguminosae shrubs.*

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[1]Alternatively called the Fabaceae.

[2] A much larger specimen grows on the University of Washington campus west of Anderson Hall.

[3] Color photographs, taken in 1980, record the last date of flowering until summer of '87 when it bloomed again in mid-July.

Winter Birds in the Arboretum

The Arboretum is good place to go "birding," even in the winter. The following list was compiled from "Checklist of Birds in the Washington Park Arboretum/Lake Washington Montlake Fill and Union Bay Marsh" by M. Hatheway, P. Mattocks, and D. Paulson. Only birds that can be seen in the Arboretum and/or Foster's Island are included below. The complete pamphlet is available at the gift shop in the Donald G. Graham Visitors Center.

Key: c= common, f= fairly common, u= uncommon, o= occasional; y= year-round, w= winter, m= migrant, s=summer

Great Blue Heron f-y
Sharp-shinned Hawk u-w
Red-tailed Hawk u-y
California Quail f-y
Band-tailed Pigeon f-y
Great Horned Owl u-y
Anna's Hummingbird u-y
Belted Kingfisher f-y
Red-breasted Sapsucker o-w
Downy Woodpecker f-y
Hairy Woodpecker u-y
Northern Flicker f-y
Pileated Woodpecker o-y
Steller's Jay f-y
Northwestern Crow c-y
Black-capped Chickadee c-y
Chestnut-backed Chickadee f-y
Bushtit f-y
Red-breasted Nuthatch f-y
Brown Creeper u-y
Bewick's Wren f-y
Winter Wren f-y
Marsh Wren f-s,u-w
Golden-crowned Kinglet f-y
Ruby-crowned Kinglet f-w
Varied Thrush u-w
European Starling c-y
Orange-crowned Warbler f-s,o-w
Yellow-rumped Warbler c-m,u-w
Rufous-sided Towhee f-y
Fox Sparrow u-w
Dark-eyed Junco f-w
Red-winged Blackbird c-s,u-w
Purple Finch u-y
House Finch f-y
Red Crossbill u-y
Pine Siskin f-y

The Arboretum Foundation's Washington, D.C. Garden Tour

The Arboretum Foundation, with tour leaders Barbara Keightley and Mary Ellen Mulder, announce their plans for a trip to view gardens in the Washington D.C. and Philadelphia area, at the peak of the bloom season.

The group will fly to Washington, D.C. and travel by coach for 2 weeks, May 8th to 22nd, 1988 before returning from Philadelphia to Seattle. Some of the gardens to be seen in Washington will be the U.S. National Arboretum, Dumbarton Oaks, the new Enid Haupt Garden at the Smithsonian as well as some important historical sites.

Around Philadelphia tours to Longwood, Winterthur, Morris Arboretum, Scott Arboretum and Henry Foundation will be made. Also included will be an afternoon tour of Mt. Cuba, a large private estate in Delaware, including tea with the owner Mrs. Lammot Dupont Copeland.

Interested parties should contact travel agent Heather Taylor 236-0990, Barbara Keightley 232-3556, Mary Ellen Mulder 232-8119, or call the Arboretum office 325-4510.

A Revision of the Genus Sarcococca

BRIAN O. MULLIGAN

Since several species of this useful and attractive genus of small evergreen shrubs have been grown for many years in gardens along the Pacific coast from British Columbia to California, readers of the Bu*lletin* may like to learn of a recently published *Revision* of its species by Mr. J.R. Sealy. Mr. Sealy is senior botanist at the Royal Botanic Gardens, Kew, near London, and author of *A Revision of the Genus Camellia* (1958), until recently the most authoritative work on that important genus.

Mr. Sealy's study on Sa*rcococca* is to be found in the *Botanical Journal of the Linnean Society*, vol. 92, no. 2, pp. 117-159 (Feb. 1986). Five of the nine species which the author recognizes are illustrated by 3/4 page line drawings by Mrs. Sealy (Stella Ross-Craig).

The genus is widely distributed in Asia, from the eastern borders of Afghanistan in the west, to India, Ceylon, China and Taiwan, southeastern Asia and Malaya, but rather surprisingly, not in Japan. Only four of the nine species are in cultivation, so far as known, and one of them, *S. confusa*, has never been found in the wild state and may be a natural hybrid.

It is doubtful whether we could grow any of the unintroduced species in the Puget Sound region outdoors, since most of them are found in warm temperate or sub-tropical regions; these might be useful in southern California or Florida. Some, however, could be grown as cool greenhouse plants, so would be worth a trial whenever seeds become available.

The *Botanical Journal of the Linnean Society* can be seen in the Natural Sciences Library at the University of Washington.

Sarcococca hookeriana *var*. hookeriana.

Plants of the Winter-Rain Regions: California

VAN BOBBITT

Van Bobbitt is Coordinator of Continuing Education at the Center for Urban Horticulture.

An Island Called California is the curious title of a book by naturalist Elna Bakker. While we know that California is not an island, Bakker suggests that "...there is ecological validity in thinking of California in insular terms." It is isolated from the rest of the continent by both topography and climate. As a result, over one-third of its native plants are endemic — that is, they grow nowhere but in California.

Topographically, California is insulated from the rest of the world by the Pacific Ocean on the west, mountain ranges on its northern and western borders, and deserts to the south and east. These barriers have prevented many species from spreading beyond California's borders.

Also, most California plants are adapted to a climate quite different from that of the rest of the continent. The bulk of California has a Mediterranean climate characterized by droughty summers and mild, rainy winters. Having lived in the San Francisco Bay region, I remember that it was common to go from early May to late September with absolutely no rain. Even then, precipitation was often scanty until December. Another aspect of the Bay Area climate that impressed me was the mild, spring-like winter weather.

This climate contrasts sharply with that of the northeastern United States, where winters are cold and precipitation plentiful and evenly distributed throughout the year. As a result, the floras of these two regions contrast also. Trees and shrubs in the Northeast are primarily winter-deciduous; sclerophylls — plants with small, hard, broadleaved evergreen foliage — are more common in California. Sclerophylls are more efficient in California's winter-rain climate. They can photosynthesize under drier conditions, better resist desiccation, and because of their evergreen habit, take advantage of the favorable growth conditions offered by the moist, mild weather of winter and early spring.

Winter-deciduous trees do exist in California, but they have other means of surviving the summer drought. For example, the majestic valley oaks (*Quercus lobata*) grow where their roots can tap into a high water table, California sycamores (*Platanus racemosa*) reside along streams, and California buckeyes drop their leaves and go dormant during midsummer.

Summer drought is also characteristic of western Washington's climate. While our droughts are short compared to California's (usually two or three months compared to five or six months), irrigation is required to keep

many of our landscape plants healthy through the summer. But by choosing plants adapted to dry summers, we can avoid time-consuming hand watering or expensive irrigation systems, and we can conserve water. (According to the Seattle Water Department, water consumption can increase by 50% in the summer, largely because of lawn and garden watering.)

California native plants have a place in western Washington's landscapes. Not only do they tolerate summer drought, but many are hardy west of the Cascades. Also, most resent the pampering of an over-protective gardener, meaning that they are low-maintenance plants *if* appropriately placed in the landscape.

In order to do this, it is important to understand a plant's native habitat and try to duplicate those conditions in the garden. Therefore, this article will examine three California plant communities — the closed-cone pine forest, the foothill woodland, and the chaparral. A few examples of potentially useful landscape plants from each community will be listed.

Aesculus californica. *photo: B.O. Mulligan*

Closed-Cone Pine Forest

The closed-cone pine forest exists along the coast where summers are cool and foggy and winters are very mild (nearly frost-free in some areas). Pines and cypresses are the dominant trees in this community. In fact, the famous, windswept cypress trees of Monterey and Carmel are representatives of the closed-cone pine forest.

Why is this community called the "closed-cone" pine forest? The pine trees that grow here are fire-dependent. Their cones tend to remain on the tree for several years, only opening to release their seeds in response to extremely high temperatures, usually created by fire.

Since many plants from the closed-cone pine forest grow in sandy soils and tolerate wind and salt spray, they might also perform well in Pacific Northwest seaside gardens.

Arctostaphylos hookeri, Monterey Manzanita. This shrub has small, glossy leaves; dainty, white to pinkish, urn-shaped flowers in early spring; bright red fruits; and smooth, reddish brown bark. It forms a low, spreading mound (about 2 feet high and 6 feet wide) on sandy sites. In our region, Monterey manzanita might be tried as a ground cover in the mildest seaside locations (*Arctostaphylos hookeri* failed to survive severe winters in the Arboretum.)

Ceanothus gloriosus, Point Reyes Creeper. This evergreen ground cover shrub is already commonly planted in the Seattle area. It has light blue flowers and small, holly-like leaves. On a dry, sunny slope, Point Reyes creeper could serve as a refreshing alternative to the over planted tam juniper.

Lupinus arboreus, Bush Lupine. This lupine is an evergreen shrub with silvery foliage and spikes of yellow (sometimes lavender) flowers. It should thrive in beach gardens. In fact, bush lupine has naturalized in several locations along Puget Sound. A thick stand of bush lupine growing adjacent to the Washington State ferry terminal at Anacortes is especially showy in May when in full bloom.

Foothill Woodland

The foothill woodland community exists along California's inner Coast Range and the western foothills of the Sierra Nevada. Its summers are hot and dry with little or no fog. Though winters are not as mild as in the closed-

Carpenteria californica, *bush anemone and* Cercis occidentalis, *western redbud, from the book,* Manual of the Flowering Plants of California*, by Willis Lynn Jepson, University of California, 1923*

cone pine forest, night temperatures rarely drop below the upper 20s (Fahrenheit). The appearance of the foothill woodland varies from a fairly dense forest to an open, park-like woodland. The dominant trees are pines and/or oaks, both evergreen and deciduous. Most plants from this community will prefer a warm, sunny location in a Northwest landscape.

Aesculus californica, California Buckeye. Being a small tree, California buckeye is well-suited to the tiny, urban lot. Its other attributes include plumes of fragrant, white flowers in the spring and silver-gray bark which is attractive all year. In nature, it grows on dry slopes.

Carpenteria californica, Bush Anemone. Specimens of bush anemone have been growing next to the Arboretum greenhouse and in the Mediterranean section for years. With its neat, clean evergreen leaves and fragrant, white flowers (May-June), this medium-size shrub deserves wider use in Seattle-area gardens.

Cercis occidentalis, Western Redbud. This small, deciduous tree (to 15 feet high) is an excellent candidate for a hot, dry bank. Western redbud is a plant for all seasons: magenta flowers in early spring:round blue-green leaves through the summer; yellow autumn foliage; and reddish-brown "pea-pods" for winter ornament.

Quercus agrifolia, Coast Live Oak. The coast live oak is common in woodlands from the San Francisco area to San Diego. Mature specimens are round-headed and spreading with gnarled branches. Dark, evergreen foliage contrasts nicely against the smooth, gray bark. In our area, it will probably grow slowly. It should do well on a warm, sunny site that receives little or no summer irrigation. Coast live oak has been grown in the Arboretum, on the University of Washington campus, and at the Carl English, Jr. Gardens in Ballard.

Chaparral

The chaparral consists of a dense cover of sclerophyllous shrubs, including many species of *Arctostaphylos* and *Ceanothus*. Plants in this community must be rugged, because they grow on hot, dry slopes and ridges in the Coast Range and on the western slopes of the Sierra Nevada. The soils vary from gravelly to a

heavy clay. Though winters are fairly mild, summers are long, hot, and dry. Despite this hostile environment, some of California's most interesting and attractive shrubs come from the chaparral.

Arctostaphylos canescens, Hoary Manzanita. This manzanita is planted in the McVay Courtyard at the Center for Urban Horticulture. Its habit may be low and sprawling or erect to six feet. Gray-green leaves, smooth red-brown bark, and tiny, white flowers make hoary manzanita a most attractive landscape shrub. It is native to dry, gravelly slopes, and like other manzanitas, requires a fast-draining garden soil.

Ceanothus thyrsiflorus, Blue Blossom. Perhaps because its natural range extends well up the southern Oregon coast, this species has proven hardier in the Northwest than most other Californian *Ceanothus*. It is a large shrub with glossy foliage and spring flowers that vary from light to dark blue. Once established, most ceanothus resent summer irrigation.

Heteromeles arbutifolia, Toyon. In the winter, when covered with bright red, holly-like fruit, the toyon is most spectacular. As its specific name (*arbutifolia*) implies, the toyon's foliage resembles that of *Arbutus unedo*, the strawberry tree. Though not considered reliably hardy in our region, a specimen of toyon near the University of Washington has survived at least the last five winters. This species has such a wide distribution in California that hardier genetic material might be found in the most northerly, highest elevation provenances.

Zauschneria californica, California Fuchsia. California fuchsia is a low, semi-deciduous subshrub and a fine ground cover in dry, sunny locations. It sends forth bright orange-red, tubular flowers which attract hummingbirds

Ceanothus thyrsiflorus, *blue blossom, from the book* Manual of the Flowering Plants of California.

from late summer to late autumn. For several years, a planting of California fuchsia has been thriving against the south wall of the Arboretum.

Those interested in obtaining and growing California natives should consult S*elected California Native Plants with Commercial Sources*, a publication of the Saratoga Horticultural Foundation, which is carried at the Miller Library, Center for Urban Horticulture.

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Magnolia Salicifolia 'Wada's Memory'

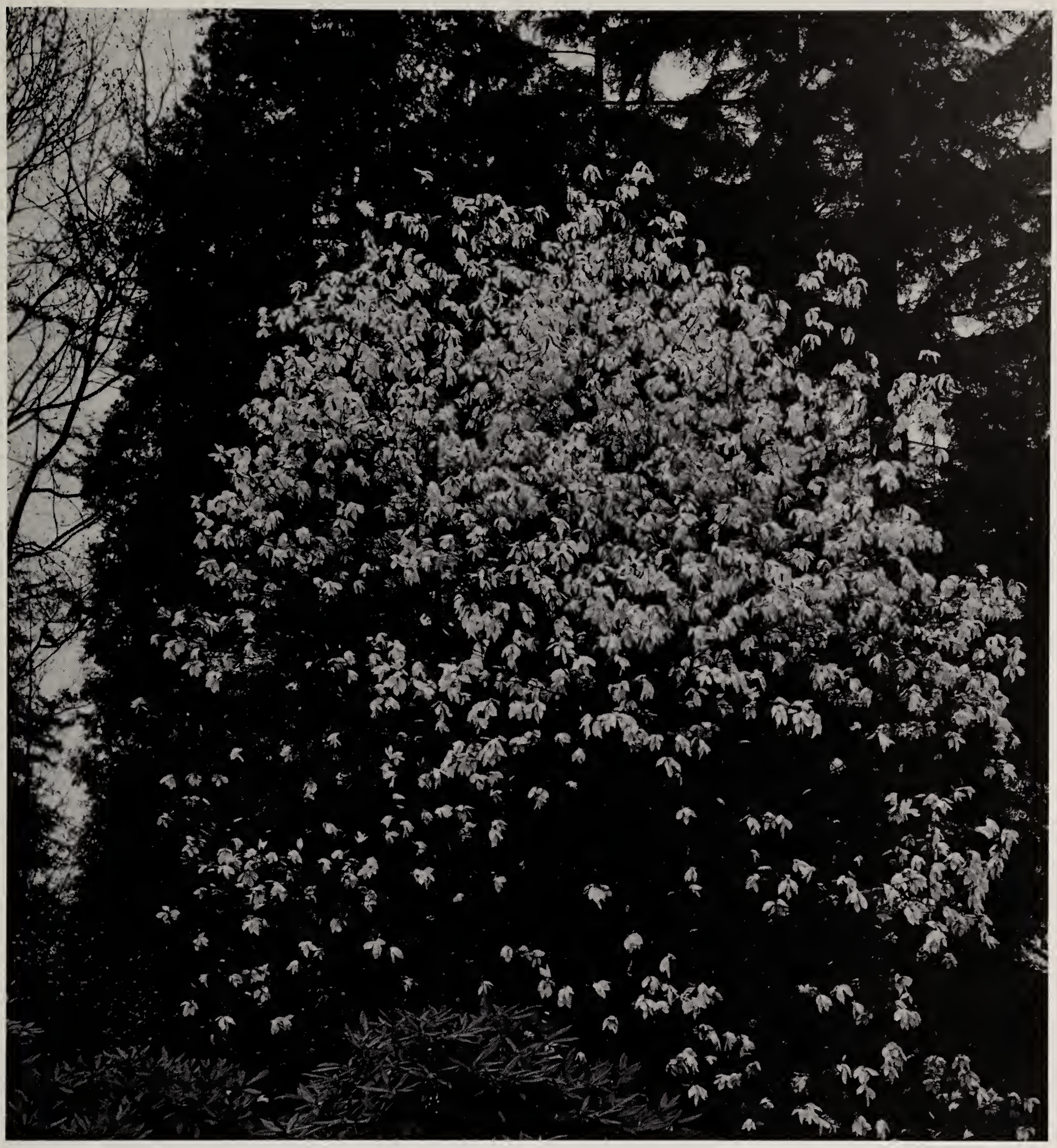
BRIAN O. MULLIGAN

It was a most pleasant surprise, when scanning the pages of the July, 1987 issue if *The Garden*, Journal of the Royal Horticultural Society, (London), (vol.112, pt.7, pp 312-313), to see a color photograph of this floriferous and handsome magnolia. And especially to learn from the accompanying article by Roy Lancaster, "Award Plants 1986, Part 1," that it has been awarded a First Class Certificate by the appropriate Royal Horticultural Society Committee at the show held in London on April 8th, 1986. It was exhibited by the Crown Estate Commisioners, The Great Park, Windsor. Mr. John Bond is Keeper in charge of the Royal Gardens at Windsor, of which the Savill Gardens form one part and will be known to some of our readers.

The history of this tree is of considerable local interest. The original plant was received at the Washington Park Arboretum in March, 1940, amongst a consignment of 21 plants of M*agnolia kobus* imported from the nurseryman, Mr. K. Wada, in Japan. At the same time we received from him the first large collection of Japanese maples. The magnolia was given the acquisition number of 869-40.

In the spring of 1947 one plant of this lot was placed in a prominent position beside Arboretum Drive at the head of Rhododendron Glen. When it flowered in subsequent years it proved to be so superior both in quantity and quality of blooms that in 1959 it was described in the *Arboretum Bulletin*, (vol. XXII, no. 1, pp 20-21, Spring 1959), and named 'Wada's Memory,' for its introducer. Mr. Wada had seen it when visiting Seattle two years earlier and suggested this name to me. Another plant propagated from the orginal stands in the bed of rhododendrons and hydrangeas across Arboretum Drive to the east; several more are thriving in other locations in the Arboretum, particularly on the bank by the service entrance to the Japanese garden (planted April 1962). Most of them have now attained 30-40 feet in height and flower profusely every year. The compact branching habit of this tree is an asset and the mahogany-red coloring of the young foliage is a distinctive character. Curiously, there seems to be no record as to what happened to the other twenty plants imported from Mr. Wada in 1940, but some of them may be in the row of *M. kobus* planted along the service road at the rear of the magnolia collection.

Plants of 'Wada's Memory,' generally raised from cuttings, were distributed widely from 1952 onwards to other arboreta, botanical gardens and nurseries in the United States, Canada and the United Kingdom. One plant was sent to Hillier Nursery at Winchester, England, in November 1959. Mr. Lancaster, who formerly worked for the Hillier Nursery, reported in his article that he was familiar with the tree growing there, planted in front of a group of *Camellia* x *williamsii* 'Donation,' which flowered at the same time as the magnolia. Two plants were sent to the late Sir Eric Savill at Windsor in March, 1961, so it was one of these which received the premier R.H.S. award in April 1986 — a quarter of a century later! Mr. Bond, in a letter to me, states that in his opinion "...it is a very distinct and beautiful magnolia." The late Dr. Benjamin Blackbuurn, for many years in charge of the Willowwood Arboretum at Gladstone, New Jersey, where a plant was sent in 1957, also thought highly of it. It would be interesting to learn whether or not it is still flourishing in such places as the Arnold Arboretum, Longwood Gardens, the Strybing



Magnolia salicifolia *'Wada's Memory' in the Arboretum.* *photo: Whitie Marten*

Arboretum in San Francisco, the U.S. National Arboretum in Washington D.C., the Callaway Gardens in Georgia, the Morton Arboretum near Chicago, the Brooklyn Botanical Garden, and the Holden Arboretum near Cleveland, Ohio. Most of these institutions received plants in 1962 or 1963, so any existing trees should be of some size by now.

Although originally thought to be a form or hybrid of *M. kobus*, and described as such, Dr. S.A. Spongberg of the Arnold Arboretum has determined that it is rather a superior form of *M. salicifolia*. See his review "Magnolias Cultivated in the U.S.A.," in the *Journal of the Arnold Arboretum*, vol. 57, no. 3, (July 1976). Our plants have now been relabelled to agree with this correction; others possessing plants should do likewise.

(Incidentaly, this is the second plant raised in this arboretum to have received an award at an R.H.S. show in London. The first was *Ceanothus* 'Puget Blue,' in April 1971.)

A Plant Hunting Trek in Nepal

Part II, The Mid-Elevations

TAMARA BUCHANAN & DOUG BENOLIEL

The authors participated in a plant hunting trek through Nepal that was sponsored by the Royal Horticulture Society and led by A.D. (Tony) Schilling. In Part I of this article (see Arboretum Bulletin, *Fall, 1987) the authors wrote about their experiences in the lower, sub-tropical elevations. In Part II they gain altitude and enter the upper temperate zone. In this, the eastern part of Nepal, the elevation is roughly between 9000 and 13,000 feet.*

Trekking in the country of Nepal is a feast for the senses. We were inundated with sights, sounds, and smells that were tantalizing and intriguing. Since our focus was on plants, our fascination with Nepal increased as we entered the elevations that sheltered species which could possibly thrive in the Pacific Northwest. At this elevation (9,000 to 13,000 feet) we encountered most of the rhododendron species that we were to see throughout the trek. Everyday we walked through territory of *Rhododendron arboreum* with its great variety in leaf shape, texture, and indumentum. The highest location that we found *R. arboreum* was at 13,000 feet on a south facing cliff where a six foot tall, stout plant had secured a foothold. *Rhododendron barbatum* grew along only one stretch of the trail, between 10,000 and 11,000 feet on the west side of Lamjura Pass. Here, large old plants formed eerie moss coated thickets. *Rhododendron campylocarpum* and *R. wallichii* looked very similar, with the latter having some indumentum and the former having none. Both species occupied similar habitats. However, it appeared that *R. wallichii,* rather than R. campylocarpum, was associated with the stunning birch *Betula utilis* var. *utilis*. At times it was difficult to tell the two rhododendron species apart as they apparently hybridize naturally. *Rhododendron hodgsonii* was scarce, being found in only one place, at 13,000 feet near the Thangboche monastery. *Rhododendron lepidotum* was first spotted around 11,000 feet at the edges of highly forested areas as a one to two foot tall shrub. More commonly, it grew on the open, weather-beaten slopes. It also

The line illustrations in this article are from the book, Flowers of the Himalaya, *by Oleg Polunin & Adam Stainton, drawings by Ann Farrer. Published by Oxford University Press, 1984.*

Betula utilis *var.* utilis, *a close-up of its distinctive bark.* *photo: authors'*

could be found accompanying *R. anthopogon* and *R. setosum* in the alpine zone. Though *R. lepidotum* seemed to prefer dry sites, these last three rhododendrons were found at times thriving in wet niches.

We encountered two potentially excellent ground covers for the home landscape — *Gaultheria trichophylla* and *Polygonum vacciniifolium* (*Bistorta vacciniifolia*) The *Gaultheria*, a relative of our salal, is a woody, spreading shrublet growing two to four inches high. It possesses very small leaves and an eye-catching, rich sky blue, pulpy fruit. We found *G. trichophylla* growing frequently along the trailside in cool moist sites — it's slow growing nature and beautiful fruit are very appealing. *Polygonum vacciniifolium*, Himalayan fleece-flower, apparently prefers moist or damp sites and was found to be deciduous in the wild. Its ability to thrive in damp soils, spread quickly and produce bright pink flowers in the fall indicate that this versatile plant could become a welcome addition to our Pacific Northwest gardens.

In other wet habitats were *Iris clarkei* and *Primula glomerata* (*P. capitata*). This lilac-colored iris grew in only a few places along our journey and always in wet areas. The largest cluster of plants was in a swale at 10,000 feet, just east of Lamjura Pass, where thousands of plants grew. Unfortunately their leaves and seed pods had been heavily foraged by water buffalo. Towering above the iris were many specimens of *Rhododendron arboreum*, each perched on a hummock of soil. The small primrose, *Primula glomerata*, was often found growing along wet sections of the trail a few individuals at a time or in large clumps.

The most common tree in this region is the birch, *Betula utilis* var. *utilis*. This moderate-sized tree which grew in relatively dense thickets displayed distinctive peeling bark. We found trees with bark that varied from nearly white to a beautiful, coppery-pink color. It was very striking and could have great ornamental value. Polunin and Stainton write of this birch in *Flowers of the Himalaya,* "Wood used for building in the inner drier regions. Bark used as paper, for waterproofing and roofing houses." Alongside and within the thickets of birch were

Rhododendron arboreum, *a common trailside sight.*
photo: authors'

extensive stands of *Rhododendron wallichii*, sometimes with hundreds of individuals six to ten feet tall. A close relative of *Betula utilis* var. *utilis* is the Jacquemont birch, *Betula utilis* var. *jacquemontii*. This birch is noted for its stark white bark and is now often used as a landscape tree in the Pacific Northwest. Another tree that we saw randomly scattered in lightly forested areas was *Sorbus cuspidata*. This ornamental tree had large, elliptic leaves that were densely woolly beneath. The fruit, about the size of a small walnut, was reddish in color.

We located a prize, *Acer papilio (A. caudatum)*, the butterfly maple. We saw only two or three of these trees during our entire trek. They grew in a protected draw, which seemed to get sun most of the day. The trunks were three to six inches in diameter with branches reaching fifteen to twenty feet in height. Of the few seeds we collected most had been destroyed by insects. We were therefore pleased when in the spring of 1986 a vigorous young butterfly maple emerged from our seedling bed. It was the only seed to germinate of the two dozen we had planted the previous autumn. As of fall 1987 it is healthy and fifteen inches high.

A few wonderful individuals of *Abies*

Abies spectabilis, *the Himalayan silver fir.*

spectabilis, the Himalayan silver fir, dotted some of the ravines. These trees were mostly pyramidal, fifty to one hundred feet tall, and with an open branching structure. They made for some very picturesque views, including one with these majestic firs framing grazing yaks and the peak Ama Dablam.

Another tree found both in forested situations and as scattered individuals was the robust maple, *Acer campbellii*. It seemed to be one of the largest deciduous trees in this elevation range. Its light green foliage allowed it to be easily picked out on the hillsides.

In the sub-alpine forests, along with *Betula utilis* var. *utilis* and *Abies spectabilis*, we found several specimens of *Prunus rufa*. This is a small tree with peeling, shiny bark. According to Polunin and Stainton, the spring flowers are solitary or clustered, white or rarely pink and are followed in the fall with "cherries" that range in color from red to black.

Juniperus recurva, the drooping juniper, was commonplace. Frequently, it grew in dense patches as a low shrub. Less commonly we found it growing as a tree. Near our camp at Pheriche, 13,900 feet, grew several 50 to 80 foot tall sentinels. We also sighted this plant as a tree within the protected, holy environs of the monastery at upper Pangboche,13,100 feet. Both of these areas are in the Inja Khola (river) drainage. This and other junipers are used intensively for firewood. We were informed by our Sirdar (lead Sherpa) that this is the reason there are so few tall junipers within this particular region. Polunin and Stainton write that the drooping juniper is the most prevalent

Acer campbellii.

Juniperus recurva, *the drooping juniper*.

dwarf juniper in the wetter regions of Nepal's alpine zone. The only pine at this elevation was the common Himalayan blue pine or as we refer to it in the Northwest, the Himalayan white pine, *Pinus wallichiana* (*P. griffithii*). It is an open-branched tree, with a single year's worth of needles attached to the stem. Long, gracefully drooping, blue-green needles and slender, long cones are other characteristics. It is also used heavily for firewood as well as for construction and carpentry. We walked by one group of porters cutting up a big pine whose destination was the Namche Bazaar, a climb of approximately 3000 feet up a canyon wall.

As we were dropping down into a protected ravine at 12,500 feet, we began to recognize a *Lyonia*. This was *L. villosa*, a large shrub or small tree which is a deciduous member of the Ericaceous family. These small trees were found only in this locale. From our observations this species was much less common than *L. ovalifolia*, which grew at generally lower elevations (See Part I). Although these two species are similar, *L. villosa* has smaller leaves that are more shaggy-haired beneath. (We now have three healthy seedlings that grew from seed collected on this hillside.) Though wildlife was generally scarcely seen on this trek, we had the rare opportunity to sight a musk deer in a thicket of *L. villosa* . Hunted almost to extinction, this small animal allowed us only a glimpse before disappearing from view. Additional plants that sparked our interest during different points of our botanical trek were *Pieris formosa*, *Androsace sarmentosa*, *Bergenia purpurascens*, *Aconitum spicatum*, and *Cassiope fastigiata*.

The elevation range between 9000 and 13,000 feet was thrilling with its many botanical "discoveries," the grandeur of its scenery, and the gentleness of its native people. Additional adventures were in store for us in the rugged terrain of snow and tundra above 13,000 feet. That is the subject of Part III.

Birch Butchery and Other Topping Atrocities

CASS CLELAND TURNBULL

Cass Turnbull is the instigator of PlantAmnesty, an organization of concerned citizens who seek to encourage and educate the public and professional horticulturalists in the fields of pruning, renovating, designing and maintaining beautiful landscapes.

I hate the winter. Not just for the cold and rain, but for what is revealed when the trees loose their leaves. Only then can the damage done by bad pruning be seen. The worst example, in my mind, is what people do to their birches — called topping, it is one of the worst and ugliest forms of what passes for pruning.

Topping has nothing whatsoever to do with pruning. A tree which has been trimmed in accordance with its natural growth shape, or "habit" is pruning. Different species have, as you know, different habits. A scarlet hawthorn is small with a round head on a straight trunk, and very twiggy inside. Weeping willows are big, wide and drippy. Hornbeams, 'Pyramidalis' and Lombardy poplars are tall and columnar-shaped. And birches are skinny and wispy and pointy on top. So why, then, do people climb up and saw off the top?

Dr. Alex Shigo, world-renowned arborist, who has investigated the effects of wounding on trees, has said that topping is the absolute worst thing you can do for the health of your tree. But life is tenacious, and most topped trees will struggle back to their habit as best they can, trying to re-establish a leader. However, instead of having a single leader, which is indicative of their natural growth, topped birches often have several sprouting from the cut. These vie with each other, often twisting and contorting. Sometimes several large upper branches will die back, leaving hunks of dead wood ugly beyond belief. A gardener- friend of mine, upon taking note of a freshly topped birch remarked, with more than a hint of sarcasm, what a "lovely umbrella birch." Gallows humor. I wince every time I see a topped birch, and recall with a mixture of amusement and horror that people pay money to have this done to their trees.

There are people who top their trees because they consider them (the trees) too big. Who decides how big a tree should be, aside from the tree itself. I don't know. Those tree owners who have done a little reading refer to a tree as being "out of scale" instead of "too big." The end result is the same. I equate tree-topping to suggesting to a tall friend that they may want to have their head cut off to make them less tall. Better, perhaps, to get a shorter tree (or friend) or maybe a tall shrub. There are other choices.

I suspect there is more to it than the tree being merely "too big." It must be some sort of feeble human cry to control nature, for I have seen many instances where someone has risked life, and yes, limb, to shinny up small pliant birches to top them. Year after year. Do they think this will stop them from getting bigger?

The first drawing represents a birch before pruning, the second the same tree after it has been topped, the third drawing shows the ill-pruned tree sending out competing leaders and the fourth depicts subsequent die-back of major limbs. *drawing: Robert Reed*

Or do they do it because they feel that their job is "to prune"?

It could also be that people have this picture in their heads of how trees should look. You know, like your grade school drawings of a brown stick with a green ball on top. This would account for any number of strange pruning practices, such as removing the lower branches of Lombardy Poplars (which Europeans have been doing for centuries). I figure people are trying to give them the "right sort" of trunk; clean and clear for a number of feet from the ground. This, however, is not the Lombardy's habit. I marvel at the tenacity of the grounds crew of a local cemetery, cutting off the suckers from the trunks of a row of these giants every year! Those branches will be growing back when the gardeners are planted there themselves.

Another favorite tree torture in the same neat-and-tidy vein is the quick crew-cut. Vine maples get this treatment a lot, usually being sawn off straight across the top, parallel to a roofline or balcony. Vine maples have a habit that kind of wiggles and is, hopefully, somewhat open. This is now they grow in the wild. In the city, when properly selected according their habit, they are planted in spaces that require a tall skinny plant that doesn't attain over 30 feet of height. In addition, vine maples turn a lovely scarlet in the fall, and have a decent winter branch pattern when pruned to enhance their open habit.

However, when my favorite neighborhood plant terrorist cuts off all the tops of his vine maples parallel to his roof line, he will be surprised to find that he has created a monster of the many-headed hydra variety. Each cut limb will sprout with numerous, skinny, ugly, straight-up branches, growing with great vigor come spring. A pruning secret which should be shouted from the rooftops and attached to each pair of electric hedge trimmers sold is that *pruning stimulates growth*. And the vine maples will respond! Only many years of patient restorative pruning can return these trees to a graceful semblance of their former selves. In the winter people apparently don't *see* the results of their handiwork, somehow this destruction is invisible to them. And in the summer, these crew-cut vine maples conform to their "glob of green" idea of what a tree is supposed to be.

Helleborus

INGEBORG NEVILL

The following article is a reprint of two articles that appeared in the spring issues of the 1944 and 1945 Arboretum Bulletins.

The genus *Helleborus* is a very interesting one and until recent years one that was sorely neglected. *Helleborus niger altifolius*, or Christmas rose, is the one that is best known and loved and is by far the most important. It probably originated in Palestine, where there is a pretty legend about its bursting into bloom on the night that Christ was born. It has beautiful, pure white, anemone-shaped, five-petalled flowers, one to two inches across, with lovely yellow anthers. The blooms appear on fleshy stems about ten inches high, one or two flowers to the stem. The leaves are dark green and leathery, shaped very much like the foliage of some of the species peonies.

The plant is easy to handle. It likes a good, rich soil that is well drained. One need not be too particular about the location for it can be planted under deciduous trees or shrubs, or it will look well against a background of broad-leaved evergreens.

Plants grown from seed are much to be preferred to divisions and they should be left absolutely undisturbed. They will grow and bloom in the same place indefinitely, the only care they need is a good dressing of well-rotted manure placed *around* them in early fall Under no condition let it fall on the crown, for the buds are formed in the fall and are liable to rot. If the leaves show black spots at any time, cut them off and burn them. It is also a good practice to cut off the old foliage after the flowers are gone or the old leaves become weather worm and unattractive. In this climate the plants are seldom in bloom before the middle of January.

The seed germinates very slowly and must be *absolutely fresh*. It can be sown in June and will not show any sign of germination until the following spring. The little plants have long roots and are sturdy and can be transplanted when they have two *true* leaves. They usually bloom in three to four years from the time of sowing.

The mature plants will stand dividing, but they suffer a good deal and are apt to sulk for quite a while. The flowers will gradually turn pink and then coppery rose. At this period the seeds have begun to form within the five capsules at the center of the flower. The petals gradually turn green, at which time the seeds are black. The flower heads then bend down and

the capsules pop open to scatter the seed on the soil below. It is quite beneficial to remove the flowers before they turn green and thus allow the strength to go back into the plant.

Helleborus niger praecox is a smaller sister of the variety *altifolius*. It usually starts to bloom early in the fall and will carry on until January. It will thrive under the same treatment.

What a drab and dull month January would be to garden lovers if we did not have the hellebores to cheer us and to make us believe that spring is already here. The sight of the beautiful, dark, crisp and shiny foliage surrounding the tight bunches of fat, early flower buds is like a tonic.

We are now speaking of the *Helleborus orientalis*, which is our favorite. There is such a variety in its shades of color, a variety that runs from deep purple, maroon, through rose and lavender to greenish white. A slightly grayed tone gives it an exquisitely soft and artistic appearance that is hard to describe. Like *H. niger*, the Lenten rose has five petals; but unlike the latter, it is much branched and the blossoms hang, probably as a protection for the lovely center rosette of ivory-colored anthers that add so much to the beauty of the flowers.

The texture of the petals is heavy and satiny, giving the flowers a very lasting quality. The buds make their appearance in early December, and in January they are well on their way and beginning to show color. They are tantalizingly slow to open which makes for a longer period of bloom.

The flowers measure up to three inches across and have a wonderful variety of color patterns made by the speckles and tracing of mauve and chocolate. They do not drop the petals which very gradually turn to a metallic rose and green. In the center five little pods form, the seeds from which will germinate the following winter and, if left until early fall, will be ready to plant out and should bloom in two to three years.

The plants are best grown in sifted shade in any good garden soil. They do not require much water as the summer is their time of rest. If grown in full sun, there is always the danger of sun scald, which makes an unsightly plant. They should be left undivided and will in a few

Helleborus foetidus *from the book* Krauterbuch, *by Dr. Fr. Losch.*

years make a fine plant about fifteen inches high and up to three feet in diameter. If there is enough space available to naturalize them or plant them in drifts, they make a charming and interesting sight. They also make a good foreground planting for evergreens for they are never unsightly. They will also do well in full shade. Old and injured foliage should be cut off. In October, they should be given a dressing of any good natural fertilizer like well rotted cow or sheep manure, blood and bone, or anything similar, which is slow-acting.

The plants are not hard to handle. Their heavy systems of fibrous roots hold the soil well in the transplanting operation which can be done any time of the year.

Helleborus orientalis is a very welcome flower for table decoration. It is most effective when floated in a low bowl or container so that its beautiful center is shown to the best advantage. Also, by cutting it in this way so many buds are saved. A few trusses of *Helleborus foetidus* combine with it beautifully. Also, if it

is cut with a long stem, particularly soft and pleasing effects can be had by using sprigs of the woolly *Stachys lanata*. When cut in such a way, the stems should be slit about an inch or so to facilitate the absorption of water. If the flowers begin to droop, they will freshen up again by being left in a cool, dark place or in a frigid air for a couple of hours. Treated this way they should keep fresh for a week or more. In the garden, they are so lasting it is almost a pity to cut them.

Helleborus orientalis is beautifully adapted to corsage making when combined with a truss or two of *H. foetidus*, and with contrasting or harmonizing colors of ribbon, it is startling beautiful. Here again its lasting quality is an advantage.

Helleborus foetidus is entirely different from its relatives, *H. niger* and *H. orientalis*. One would hardly believe it belonged to the same family. Only in the formation of the seed pods and in the heavy texture of foliage and flower does one see the resemblance. The foliage is dark green and very palmate. It reminds one of the leaves of the umbrella plant. The buds begin to appear early in December, shooting up from the center of the stalk, gradually unfolding and branching out into a large loose panicle of chartreuse bells edged faintly with red. Individually, the bells resemble the fritillaria. Eventually each bell opens into a flat, five-petaled flower about an inch across. The panicle spreads out until it often measures a foot and a half. The seed pods appear somewhat later but the transition is so gradual that it covers several months. About the latter part of May the top should be cut down to the ground. At this time there should be several sprouts springing up from the crown (usually from five to seven of them), which develop into next year's flower stalks and will make a very large plant. The root system is very small compared to the above-ground parts, making it unsafe to move any but the young plants. It seeds readily and will bloom in two to three years from the time of seeding. It will take any good garden soil, sun or shade. As a cut flower, it will last for many weeks, but needs another flower combined with it. It is a lovely flower together with *H. orientalis* and *H. niger*. One complements the other. If used in corsage work after the seed pods appear, they should be removed or it makes them too heavy. The plants cannot be divided.

Helleborus cyclophyllus is in every way like *H. foetidus* except that it is a little larger and heavier, and the red rim a bit more distinct. Of the two, the latter to to be preferred.

Helleborus corsicus. This hellebore is not quite so familiar to us. We purchased some plants, Unfortunately only one survived and sulked along until last year when it decided to reward us with a sickly looking flower truss. This year, however, it is taking more interest in life. The truss is a little larger and looks healthy. We are hoping for a few seeds.

The flowers resemble those of *H. foetidus*, but are more fluffy and delicate, and without the red rim. So far there is only a single truss and it does not look as though it will develop into the generous panicle the *H. foetidus* offers us.

The foliage is beautifully shiny and sharply sawtoothed, and is shaped into three leaves like the foliage of the poison ivy. The plant we have is much smaller than *H. foetidus*. It blooms earlier and is already (February) sending up the sprouts for next year. We think a mass of them would be lovely. This is all the information we can give of *H. corsicus*.

Funk & Wagnall's dictionary speaks of European White Hellebore, *Veratrum album*, and also shows an illustration of it. It looks quite different from the ones we know. We would be very glad to get some information about it Johnson's dictionary says, "There are great doubts whether any of the species be the true hellebore of the ancients."

The winter aconite, the dear little here-I-am-flower that suddenly pops up its cheerful little yellow face framed in the fresh green collar, also belongs to the family. The five seed pods tell the story.

With this wealth of lovely and fascinatingly different flower material why should any Western Washington garden look dead and uninteresting during the winter months?

In the Arboretum...

It has been a productive fall at the Arboretum, with some special projects added to the schedule of routine plant care. One of our most significant projects is the development of the J.A. Witt Winter Garden. The progress this fall included transplanting some large plants to other locations, major regrading of the central section, and installation of a new path. Because poor drainage has been a problem in this area, special measures and care are being taken to improve both surface and subsurface soil drainage. Drain tile was installed along the path and extending into the beds along the east side of the garden. Leaf mold was deep tilled into the heavy clay soil to improve aeration and drainage. The wet winter weather has put the soil work on hold, but we will continue soil improvement and berm construction in the spring.

Another special project is the development of the bank across from the Donald G. Graham Visitor Center. The bank has been regraded, with two new paths that provide direct access between the buildings and the collections. One of these paths has been ramped to provide wheelchair access. The end of Azalea Way is being re-routed to meet the Visitor Center entrance. Many thanks go to the City Park's crews for their fine work on this project. Work should be completed this winter, with landscape planting to follow in the spring.

Evergreen foliage, gold and white variegated leaves, interesting textures, and winter flowers enhance the containers and raised beds around the Visitors Center. This winter display was designed by our staff, with support from the Arboretum Foundation. Watch for seasonal changes in these planters as new plants and designs are installed.

New projects are underway at the Japanese Garden. A new soil drainage system was installed in the cherry orchard and work has begun on a new ticket booth and sound-proofing fence. The Garden is closed each winter from December 1st to March 1st.

Several collection areas are receiving a face-lift with much needed pruning, removal of invasive weeds and brush, and mulching of beds. The Memorial Hillside, Himalayan Hillside, Loderi Valley, Woodland Garden, and the southeast end of Azalea Way should all be especially beautiful this spring as a result of our staff's fine efforts here.

The renovation of the greenhouse is scheduled to continue this winter with the installation of new greenhouses on the existing foundations. Additional work to the headhouse area will also be required.

Two of our long-time crew members, Fred Mauch and Bob Hilzinger have been out on medical leave since summer. We look forward to their speedy recovery and return. During the interim we have been fortunate to have the support of three temporary staff.

Christina Pfeiffer
Horticulturist

Book Reviews

The RHS Encyclopedia of House Plants. The Royal Horticultural Society, Kenneth A. Beckett, and American consultant Victoria Jahn. Salem House, Boston, Massachusetts. 1987. 492 pages. Price $34.95

You can trust, like any work to which the Royal Horticultural Society adds its name, the accuracy of this comprehensive volume. An encyclopedia however is rarely complete and this work is no exception. I find the term "house plants" outdated and misused here. Today we speak of plants for interiors or interiorscapes. The term house plants is best left to Victorian parlors. Also, the volume contains plants which seldom are grown indoors, instead they are more suitable for the greenhouse or patio.

The first 43 pages are devoted to general information about culture, propagation, diseases, etc. Written in general terms, these sections will give amateurs a basic guide. If the reader becomes interested in specific plants, they surely will want to search for specific information in another book. The major portion of the volume is devoted to an alphabetical listing of plants with brief description of each. The authors have attempted to provide the most pertinent details about the very voluminous field of plants that can be grown for interiors. They have made a rather complete list of the major species, but like all comprehensive volumes of this type, it does little to help those caught in growing and identifying the many varieties and/or cultivars now prevalent in the trade.

The volume is easy to read, well-indexed, with a superb glossary, and it is printed on excellent paper. Obtaining and using good photographs is often a challenge for the garden-book writer, however in this instance the authors met the challenge successfully. It is taxonomically accurate and adequate cross-references are made.

For those of you who want an easily-read reference on interiorscape plants, this surely is the one for your library. If you care to study a plant in more detail, this volume could be a start, but eventually you would want to search elsewhere. For the price, it can not be beat!

John A. Wott

New on the Shelf

Valerie Easton

Plants for Dry Climates: How to Select, Grow and Enjoy, by Mary Rose Duffield and Warren D. Jones. HP Books, Tucson, AZ. 1981.

A timely book after our rain-free summer which includes over 300 drought-tolerant plants and over 500 color photos. Temperature zones and cold hardiness are clearly noted for each plant, along with landscaping suggestions.

Hydroponics for Everyone; A Practical Guide to Gardening in the 21st Century, by Dr. Struan K. Sutherland. Hyland House, Melbourne. 1986.

Written by an Australian scientist, this book explains clearly with the help of diagrams and photos, how setting up your own hydroponic unit can be no more complicated than growing pot plants in soil. Benefits include control of nutrients, elimination of weeds and stooping, and controlled results. If you can put up with the author's cartoons and attempts at humor, the book contains well-presented, thorough information.

Plants Plus; A Comprehensive Guide to Successful Propagation of House and Garden Plants, by George Seddon and Andrew Bicknell. Rodale Press, Emmaus, PA. 1987.

Describing itself as a "horticultural baby care book," *Plants Plus* seeks to increase the home gardeners pleasure and lower costs through simple propagation techniques. Clear illustrations and a well-organized text show the various forms of propagation and explain how to carry them out on a wide variety of plants, including over 200 different kinds of indoor plants.

Sharing Nature with Children: A Parents' and Teachers' Nature Awareness Guidebook, by Joseph Bharat Cornell. Ananda Publications, Nevada City, CA. 1979.

Activities such as micro-hikes and camouflage help kids to "feel" nature as they learn about it, in an enthusiastic yet sensitive approach to nature education. This is one of over 30 books recently acquired by the Miller Library to help support the children's program in the Arboretum. They include books for adults teaching children about plants and nature, and children's books about plants and the natural world.

Included in the listing below of new books in the library are several more titles from the booklist *Children and Nature,* which is available in the Miller Library.

Other New Books

Brady, Nyle C. *The Nature and Properties of Soils*, 9th ed. Macmillan, New York. 1984

Brown, Marc Tolon. *Your First Garden Book*. Little, Brown & Co., Boston. 1981. Suggested projects for beginning gardeners outline how to sprout seeds, turn soil, plant, and care for the results.

Cork, Barbara. *Mysteries & Marvels of Plant Life*. Usborne Publishing, London. 1983. A fascinating introduction to the unusual, extraordinary and unexplained in the plant world.

Dirr, Michael A., and Heuser, Charles W. *The Reference Manual of Woody Plant Propagation. From Seed to Tissue Culture.* Varsity Press, Athens, GA. 1987.

Douglas, William Lake. *Hillside Gardening: Evaluating the Site, Designing Views, Planting Slopes*. Quarto Marketing Ltd., New York. 1987.

Fisher, John. *The Companion to Roses.* Salem House, Topsfield, MA. 1986.

Haw, Stephen G. *The Lilies of China; The Genera Lilium, Cardiocrinum, Nomocharis and Notholirion*. Timber Press, Portland. 1986.

Mabey, Richard. *The Frampton Flora.* Prentice Hall, New York. 1986.

Mitchell, Andrew. *The Young Naturalist.* Usborne Publishing, London. 1982. A wide variety of activities to enthuse and enlighten kids about the outdoors are well described and illustrated.

Nussbaum, Hedda. *Plants Do Amazing Things*. Random House, New York. 1977. Describes a variety of plants with unusual characteristics, including those that give off light and those that eat insects.

Philbrick, Helen and John. *The Bug Book; Harmless Insect Controls*. Garden Way, Pownal, VT. 1987.

Suzuki, David T. *Looking at Plants*. Warner Books, New York. 1987. Written by the host of the PBS TV show "The Nature of Things," this idea book teaches an appreciation of living, growing things, and includes simple "Rules for Nature Lovers."

All of these books can be found in the Elisabeth C. Miller Library, Center for Urban Horticulture, 3501 N.E. 41st Street. The library is for reference use only. Hours are 9-5 Monday through Friday.

Special thanks to the individuals and organizations who have contributed these books to our library.

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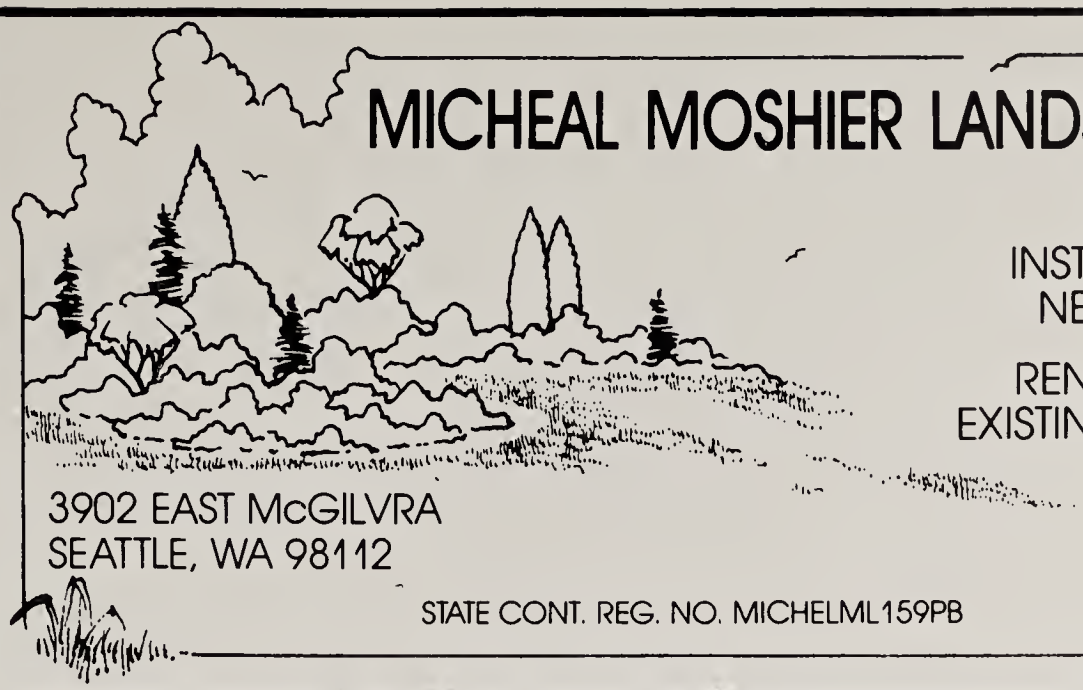

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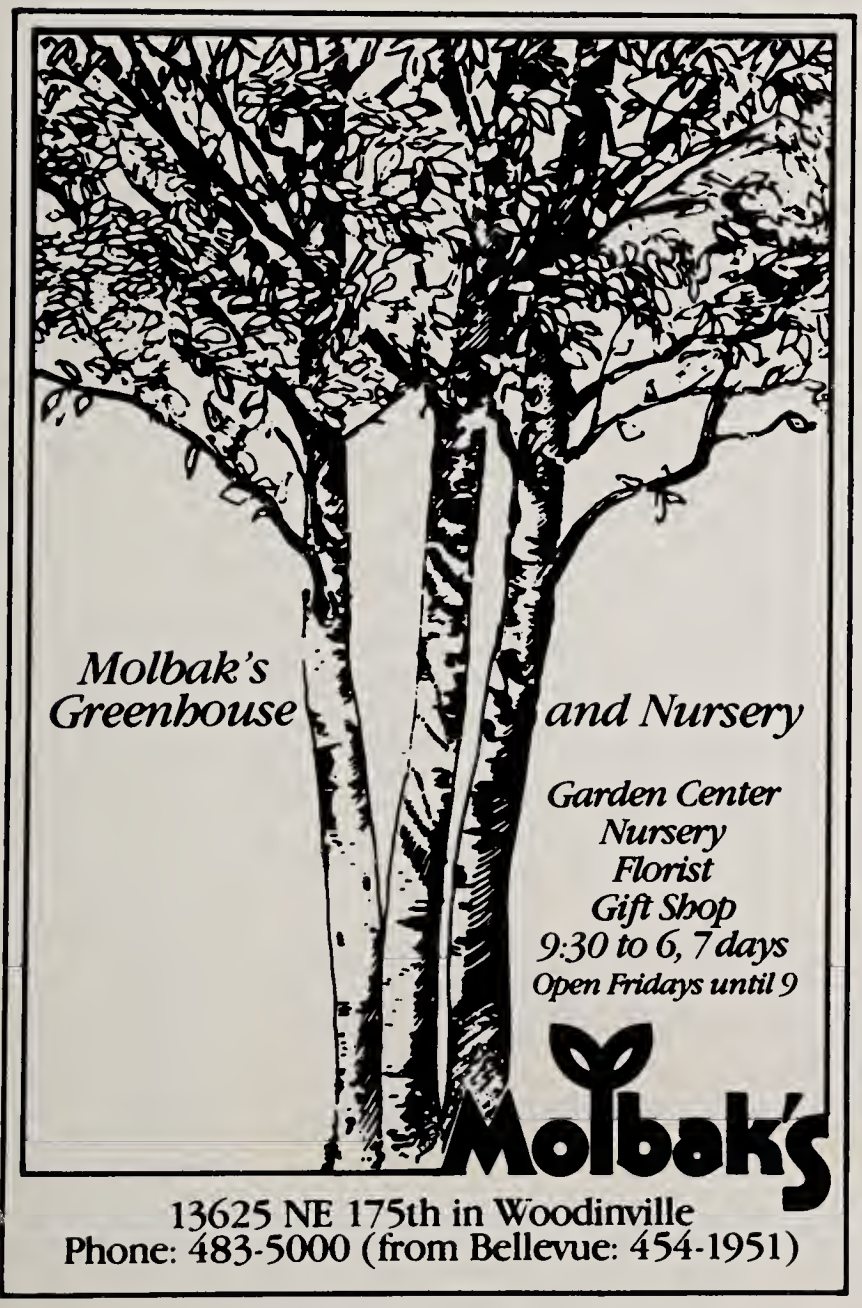

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